December 28th, 2020

NATIONAL MARINE FISHERIES SERVICE
Northwest Regional Office
7600 Sand Point Way NE
Seattle, WA 98115

Re: NMFS Biological Opinion WCR-2016-4993, Monitoring Report

As required by conditions listed in the Biological Opinion for Electron Hydro Diversion Repair and Spillway Replacement, this document contains data consistent with section 2.9.3 Reasonable and Prudent Measures, and section 2.9.4 Terms and Conditions.

The in-water work window of 2020 for continuation of Phase 1 of the project was July 15 – August 5, until a stop-work order was issued. Construction re-commenced on September 23 through emergency permitting and was completed October 28. The scope of work for 2020 included construction of a temporary cofferdam and flow bypass on the right bank, pouring a concrete footing and center wall, and constructing a temporary rock-fill spillway.

The following information addresses the requirements and complies with provisions stated in Reasonable and Prudent Measure 4.

4.a.i

1.) Attachment 1: Construction Activities
2.) Attachment 2: Water Quality Monitoring

3.) To prepare for the in-water work season of 2020, Electron Hydro mobilized a fleet of equipment to the intake work site by July 14. Construction activities commenced on July 15, with the excavation of a berm in the center of the Puyallup River that would serve as the cofferdam diversion footprint. The berm was extended approximately 300 ft. upstream, and steel conex boxes were placed along the berm to serve as the left bank side of the cofferdam. Dewatering of the right bank occurred shortly after river diversion. Fish recovery within the fish ladder took place, and construction of the cofferdam bypass channel began. The cofferdam (2,409 yd ^{2}) was built along the right bank for the purpose of excluding water from entering the left bank work area. The cofferdam was completed, and water was rediverted to the right bank to allow for left bank de-watering. A power generating facility flume, basin and forebay de-watering commenced on July 28 and concluded July 29.

Removal of the left bankhalf of the old wooden spillway and underlying materials began on July 30, as soon as the dry riverbed was negotiable by heavy equipment. Over the next week, construction activities consisted of demolishing and removing the wooden spillway and excavating bedload materials in order to excavate down to the required foundation elevation. A stop work order was issued on August 5, and Electron completed emergency shoring activities to ensure worksite stability until stop work order was lifted.

Work re-started on September 23 after agency approval was received. The worksite was de-watered and prepped for pouring of the new spillway's concrete footing. Sheet pile driving, concrete form placement, and removal of excess bedload continued until the proper elevation was reached. Concrete pouring began October 1. All components of the concrete footing, wall, and existing apron tie-in were completed and curing by October 18. Construction of the temporary rock spillway began on October 18. Sheet pile formed the skeleton of the spillway wall, and the upstream and downstream area surrounding the sheet pile spillway were filled in and graded with large rock, smaller riprap, bedload and fines. Work on the temporary spillway was completed on October 24.

Crews diverted the river to the left bank for the final time on October 25. The right bank was de-watered and an extensive fish recovery operation took place. The de-watered river and fish ladder were cleared of fish, and removal of the cofferdam and supporting structures began the following morning. The cofferdam was removed, the riverbed was regraded to match the natural river profile and all equipment was removed from below the ordinary high water mark through October 28. All construction activities, including their dates active and their duration, are enumerated in Attachment 1.

Conservation measures taken to reduce turbidity and fish species take vary depending on construction activity and location. On July 29, the HDPE liner experienced a failure. Part of the HDPE liner and underlying materials were torn away from the spillway and transported downstream by river flow. This partial release of material created a need for mitigation, and Electron Hydro immediately moved to locate, secure, and remove all of the released material, which including HDPE liner, liner felt, field turf material, and embedded crumb rubber. The efforts to identify and remove this debris are detailed in Attachment 4. All oil spills encountered were promptly assessed and cleaned up using spill kits and absorptive materials. No spill occurring during the in-water work period resulted in contamination reaching the river. Several potential area de-waterings were assessed immediately. Fish recovery was performed on several occasions by the on-site fishery biologist and trained staff. A total of three fish were observed and returned to the river during this in-water work period. No electrofishing was performed at any time. All conservation and mitigation efforts implemented are listed and described in Attachment 4. Fish recovery efforts are detailed in Attachment 3.

Turbidity levels were monitored by qualified staff throughout construction activities. During construction, significant amounts of sediment were disturbed shortly after dewatering any previously saturated area, and after re-watering or diverting water to a previously dry section of riverbed. In particular, the removal of saturated bedload material and demolishing the left side of the spillway apron contributed significant amounts of suspended sediment to water seeping into the still-dewatering worksite.

Between August 10 and September 23 while construction was paused, turbidity measurements continued in order to identify a general background turbidity. The Puyallup River showed great natural variations in turbidity during this time, at one point reaching an approximate turbidity of over 1500 NTU to just under 100 NTU ten days later (August 17 to August 27). Turbidity was correlated with hot daytime temperatures. Several of the highest recorded turbidities were found on July 30-31 (reaching 2500 NTU upstream of the worksite) after July 29-30 temperatures of 88 to 90°F, and on August 17 (approx. 1500 NTU upstream) after an August 16 high of 97°F.

Once construction re-commenced on September 23, the average daytime temperature had decreased notably, and NTUs largely stabilized across the sample sites. The implementation of best management practices, less disruption of saturated bedload slurries, and cooperative weather all combined to reduce incidences of turbid discharge on the worksite through the remainder of the project. All turbidity and suspended sediment monitoring is listed in Attachment 2.

4.) Attachment 4: Conservation Measures Implemented

Corrective actions taken to specifically reduce turbid discharge included several practices aimed at minimizing impacts to the environment. Pumps throughout the worksite were used to de-water the immediate construction areas, and that water was pumped into a forested dispersal area if determined to be too turbid for release. A large settling pond and long conveyance ditch were both briefly in use. Utilizing pumps for dewatering and removing turbid water, as well as halting sediment generating activities, were the most widely used and effective methods for turbidity control. While construction efforts did occasionally affect turbidity to a degree, many different strategies were tried in order to successfully route turbid water from the large dewatered area that sat below the water table line. Good efforts were made to stay within the NTU parameters set forth by the NMFS Biological Opinion.

4.a.ii.
1) Attachment 1: Construction Activities
2,3,4) Attachment 3: Headworks Fish Recovery

Attachment 5: Supporting Photographs

If you have any questions, comments, or requests for additional information, please feel free to reach out to me at (360) 761 – 1588.

Thank You,

Mallory Voyk
Fisheries Biologist
Electron Hydro, LLC

Attachment 1. Construction Activities	
Date	Activity Description
- 07/10/2020	Equipment mobilized to site.
07/15/2020	Center bedload berm in Puyallup River created upstream of intake via excavator.
07/17/2020	Center berm extended; partial right bank dewatering begins. Wooden spillway crest removed. Plywood laid on top of wooden apron. Fish ladder flow suspended.
07/18/2020	Center bedload berm extended; conexes placed along center berm and filled with bedload material. Began placement of HDPE liner. Excess water routed through fish ladder. Equipment used includes two excavators, a telehandler forklift, and lattice-boom crane.
07/20/2020	River fully diverted to left bank; pumps assist with dewatering. No fish observed by crew.
07/21/2020	Work on bypass channel continues. Field turf and HDPE placed along channel by hand and forklift.
07/22-24/2020	Cofferdam work continues. Right bank dewatering complete.
07/27/2020	Cofferdam bypass channel completed. Conexes and sediment berms cover 1,645 yd^2 of riverbed.
07/28/2020	Water diverted into the right bank bypass channel, flume dewatered
07/30/2020	Begin removal of eco blocks and wood apron on left bank. Four excavators, a haul truck, and a crane doing work below OHWM. Fish ladder flow confirmed as restored.
07/31/2020	Retention and bolstering of conexes, hauling away wood apron debris via haul truck.
08/01/2020	Removal of wood apron debris continues, retention of construction runoff. Removal of I-beams and plates from across flume intake.
08/03/2020	Removal of bedload slurry and wood debris from dewatered work area continues.
08/05/2020	Grading and bedload removal from dewatered worksite. Manhole placement in de-watered work area. Stop Work Order issued by Pierce County.
08/06/2020	Grading and bedload slurry materials removal. Manhole placement continues. Groundwater collecting pool upland of the intake partially filled in. Drainage/settling ditch constructed in dry riverbed area downstream of construction area.
08/07/2020	Construction halted. Mobilization of equipment to Forebay.
08/08/2020	Excavation and bedload slurry removal continue.
08/09/2020	Sand and apron wood placed in lower area of de-watered work zone.
08/10/2020	Construction work is halted at intake. Forebay sediment removal begins.
09/23/2020	Construction recommenced @ 14:00. Cofferdam stabilized, pumps replaced at site per WQMP.
09/24/2020	Construction site de-watered. Preparation for excavation. Work halted from 10:00 – 10:45 to allow turbidity in conveyance channel to decrease.
09/25/2020	Excavation continued on concrete footing area. Sheet pile driving commences. Excavator with vibratory compactor and crane utilized. Pumps

	remain active for site dewatering. Fish oil spill of approx. 1-2 gallons promptly addressed.
09/26/2020	Sheet pile driving continues.
09/27/2020	Excavation and removal of material continues. Sheet pile driving and dewatering continues. A pool formed upstream of the worksite with rain event on 9/26. Fish recovery undertaken. No fish observed; pool cleared.
09/28/2020	Excavation continues. Concrete pour prep continues.
09/29/2020	Excavation continues. Rebar sections for concrete footing staged and put into place. Concrete prep continues.
09/30/2020	Rebar installation continued until a large leak into worksite was detected. Delay of approx. 4-6 hours to address leak and dewater. Concrete plant readying.
10/01/2020	Rebar tying finished. Concrete pouring begins
10/02/2020	Concrete pouring of the cutoff wall for footing continues. Crane platform regraded.
10/03/2020	Concrete pouring of cutoff wall continues. Rocks placed at outflow of fish ladder to attempt to fix passage issues.
10/04/2020	Pouring concrete center abutment.
10/05/2020	Layout and installation of wood wall forms for concrete wall. Fish ladder revisited and passage remedied.
10/06/2020	Access road maintenance, wall rebar installation. Dewatering with pumps continues.
10/07/2020	Rebar and form installation for center abutment. Access road maintenance. Fill excavation and removal from downstream side of existing wall.
10/08/2020	Forms, rebar, and embeds for bladder installed. Concrete plant and pour prep. Material around concrete footing backfilled.
10/09/2020	Finished form embedding. Concrete poured into center abutment.
10/10/2020	Finished pour in center abutment. Crews removed equipment from in-river work area.
10/11/2020	No in-river work. Concrete curing.
10/12/2020	Concrete forms removed from abutment. Site cleaned and equipment removed.
10/13/2020	No in-river work. Weather postponement.
10/14/2020	Excavation for river re-diversion and cofferdam removal begins. Forms and rebar prepped for pouring concrete tie-in platform between new wall and existing spillway.
10/15/2020	Pouring concrete for wood apron tie-in. Pumping/dewatering of construction area. Excavation for downstream road access.
10/16/2020	Woodwork between existing spillway and abutment wall. Concrete pour prep.
10/17/2020	Concrete pouring to join spillway to abutment. Upland oil spill addressed promptly.
10/18/2020	Sheet pile installation and rock sorting for temporary spillway.
10/19/2020	Spillway sheet pile installation continues. Capping tie-in between abutment and spillway. Hauling rock for spillway fill begins.

10/20/2020	Center abutment cleanup. Sheet pile welding continues. Rock hauling and placement continues.
10/21/2020	Sheet pile welding finished. Large rock and smaller riprap installed on downstream side of sheet pile spillway.
10/22/2020	Rock placed on upstream side of sheet pile spillway. Abutment wall holes grouted.
10/23/2020	Left bank channel filled in and graded. All pumps removed from below OHWM
10/24/2020	Graded upstream dry riverbed and prepped upstream for final diversion of river to left bank
10/25/2020	Excavators diverted river to left bank. Cofferdam berm built up. Right bank dewatered, right bank and fish ladder cleared of fish. Water flow through ladder suspended.
10/26/2020	Field turf, felt fabric, and HDPE liner removal from dewatered right bank begins. Liner partially removed from fish ladder. Water flow through ladder suspended.
10/27/2020	Turf, fabric, and liner removal from right bank continues. Foreign material removed by hand, via industrial vacuum, and via heavy equipment. Water flow through ladder suspended.
10/28/2020	All foreign material in riverbed removed from worksite. Wooden spillway crest reinstalled. Conex containers emptied and removed from river. Bedload and berms upstream of spillway regraded. Lower entrance to fish ladder re-rocked and graded. Fish ladder flow restored. River grade and flow restored.
10/29/2020 -	Equipment demobilization and winterization.

Attachment 2. Water Quality Monitoring

**07/15/2020 – 8/24/2020: Turbidimeter giving suspect readings. Transparency tube readings converted from cm to NTU and reported; turbidimeter readings reported in parenthesis.*

		Turbidity (NTU)		
Date	Time	Upstream	Downstream	Sampler
07/15/2020	8:30	325	440	MV
07/15/2020	15:00	170	260	MV
07/18/2020	12:30	180 (87)	205 (109)	MV
07/21/2020	12:30	280 (156)	450 (197)	MV
07/23/2020	NA	175	270	CK
07/24/2020	10:00	480 (194)	320 (170)	MV
07/30/2020	9:00	440 (>200)	610 (>200)	MV
07/31/2020	08:00	2500 (>200)	3100 (>200)	MV
08/01/2020	13:30	480 (>200)	550 (>200)	MV
08/03/2020	09:35	230 (108)	290 (120)	MV
08/05/2020	09:15	210 (116)	320 (134)	MV
08/06/2020	11:00	125 (75.3)	145 (88.5)	MV
08/07/2020	11:00	97 (61)	110 (58.2)	MV
08/08/2020	11:00	97	115	MV
08/10/2020 - Sediment generating activities ceased				
08/10/2020	15:30	690 (>200)	560 (>200)	MV
08/11/2020	7:40	350 (179)	420 (178)	MV
08/12/2020	14:00	205 (85)	200 (86)	MV
08/13/2020	13:05	155 (64)	110 (62)	MV
08/14/2020	15:40	91	95	MV
08/15/2020	12:40	270 (102)	190 (96)	MV
08/17/2020	07:30	960 (>200)	1000 (>200)	MV
08/17/2020	17:00	1500 (>200)	1500 (>200)	MV
08/18/2020	07:55	730 (>200)	750 (>200)	MV
08/19/2020	08:15	250	265	MV
08/20/2020	16:05	215 (104)	175 (100)	MV
08/24/2020	09:10	104 (65)	115 (63)	MV
**** New EPA-compliant turbidimeter arrived. In use as of 08/26/2020.***				
08/26/2020	08:10	210	170	MV
08/27/2020	13:30	104	98.7	MV
08/28/2020	08:10	165	154	MV
08/29/2020	09:20	270	240	MV
08/31/2020	12:05	270	220	MV
09/01/2020	14:20	500	500	MV
09/02/2020	12:50	550	390	MV
09/03/2020	08:15	600	450	MV
09/08/2020	07:20	180	155	MV
09/09/2020	15:25	120	120	MV
09/10/2020	09:35	160	160	MV
09/14/2020	10:15	95	85	MV

09/15/2020	09:15	160	150	MV
09/16/2020	10:15	115	105	CK
09/17/2020	7:15	100	100	CK
09/18/2020	10:00	135	122	CK
09/23/2020 - Sediment generating activities began as construction recommenced.				
09/23/2020	11:45	136	140	CK
	15:05	650	650	
	16:05	700	725	
	17:00	1000	1000	
09/24/2020	06:00	950	950	Ck
	12:00	700	650	
	14:30	450	360	
	18:00	330	253	
09/25/2020	06:20	100	95	Ck
	08:00	81	85	
	11:30	65	65	
	13:00	80	75	
09/26/2020	06:30	50	50	Ck
	08:00	45	40	
	09:00	40	37	
	13:30	38	38	
09/27/2020	06:30	25	26	CK
	07:00	25	25	
	08:00	25	23	
	09:00	25	23	
	12:15	21	22	
	14:30	22	22	
09/28/2020	06:30	23	22.5	CK
	17:00	26	24	
09/29/2020	06:30	50	45	CK
	09:00	55	48	
	15:00	35	33.5	
09/30/2020	06:30	55	45	CK
	07:00	58	45	
10/01/2020	06:30	55	50	CK
	13:00	45	40	
10/02/2020	06:30	55	40	CK
	08:00	50	40	
	16:00	39	35	
10/03/2020	03:22	95	80	CK
	15:06	28	28	
10/04/2020	06:30	39	35	CK
	15:00	27	27	
10/05/2020	07:00	60	60	CK
	13:00	55	50	
10/06/2020	08:00	320	300	CK

	10:45	1000	1000	
	15:00	1000	1000	
10/07/2020	07:30	120	120	CK
	09:00	130	120	
	15:00	95	95	
	17:00	95	90	
10/08/2020	07:00	65	60	CK
	07:45	65	60	
	08:45	65	60	
	1230	60	60	
10/09/2020	03:30	100	95	CK
	12:30	65	60	
10/10/2020	11:15	370	542	CK, BE, BD
	13:15	180	258	CK, BE, BD
10/11/2020	No Work Occurred			
10/12/2020	08:30	370	310	CK, BE, BD
	10:30	180	175	CK, BE, BD
10/13/2020	No Work Occurred			
10/14/2020	05:00	11	9.6	CK, BE, BD
	14:57	18	17	
	16:03	20	16	
	17:15	18	16	
10/15/2020	09:30	11	11	CK, BE, BD
	14:57	9.5	8.6	
	15:42	9.5	9.3	
	16:55	8.6	8.5	
	17:56	8.4	8.4	
10/16/2020	07:30	7.4	8.5	CK, BE, BD
	10:36	24	28	
	14:41	65	60	
	17:22	200	140	
10/17/2020	06:15	263	160	CK, BE, BD
	08:01	170	120	
	09:36	120	90	
	16:58	80	60	
10/18/2020	07:00	750	700	CK, BE, BD
	13:00	800	800	
	16:00	850	800	
10/19/2020	07:15	103	90	CK, BE, BD
	16:00	41	39	
10/20/2020	05:00	22.6	22	CK, BE, BD
	07:00	12.5	12.5	
	16:00	11	11	
10/21/2020	05:00	11.5	11.5	CK, BE, BD
	10:15	11.6	11	
	11:56	10.66	10.33	

	13:00	11.33	9.43	
	15:00	10.66	11	
10/22/2020	05:00	8	7.4	CK, BE, BD
	07:30	7.7	7.8	
	13:30	7.1	7.0	
10/23/2020	08:00	10	10	CK, BE, BD
	12:30	10	9.5	
	16:00	9.75	9.5	
10/24/2020	06:00	88.3	73.3	CK, BE, BD
	13:00	80	75	
	16:00	75	70	
10/25/2020	08:00	11	11	CK, Staff
	10:00	10.5	11	
	10:30	9.5	80	
	11:00	10	160	
	11:30	10	160	
	12:00	9.5	165	
	12:30	9.5	200	
	13:00	9.5	390	
	14:45	9.5	190	
	15:15	9	185	
	16:15	9	190	
10/26/2020	07:00	6.1	7.4	CK
	08:55	8	7.3	
	11:50	4.7	8	
	16:00	4.6	5.5	
10/27/2020	06:00	5.1	5.4	CK
	09:45	7	7	
	12:30	5	6.7	
	16:30	4.4	9.2	
	17:30	4.4	7.7	
10/28/2020	06:00	9.8	9.4	CK, Staff
	07:00	10.1	8.7	
	7:30	9.4	12	
	08:00	7.8	17.3	
	08:30	7.1	19	
	09:00	7	12.6	
	9:30	7.1	13	
	10:00	7	12.5	
	11:00	6.5	13	
	12:00	5.9	16	
	13:00	5.8	23.6	
	14:00	5.8	83.3	
	15:00	5.7	70	
	16:00	5.8	39	

Attachment 3. Headworks Fish Recovery		
Date	Fish Recovered	Activity Description
• *Electrofishing was not used during fish recovery.*		
07/24/2020	2 rainbow trout, excellent condition (150-200 mm)	Crew and fish biologist performed fish recovery in fish ladder after flows redirected to allow liner installation at ladder. Efforts consisted of seining and hand dipnetting. Two rainbow trout (approx. 150 – 200 mm) recovered, placed in aerated buckets and immediately returned to river below diversion in excellent condition. No other fish sighted. Ladder not dewatered.
09/27/2020	None sighted	River had breached previously dry area upstream of the cofferdam overnight. Breach pool was assessed for possible fish recovery needs. Performed fish recovery. No fish sighted. A blockage at the downstream end of this pool was removed by hand to allow connectivity to the river.
10/25/2020	1 rainbow trout, excellent condition (220 mm)	Crews and fish biologist cleared dewatered right bank and fish ladder in extensive fish recovery effort. Recovery included the use of a 15 ft. seine net, water containers, and several handheld dipnets. One fish (rainbow trout, 220 mm) recovered and returned to river downstream of spillway in excellent condition. Fish ladder cells partially dewatered using screened 3" pumps. Cells seined prior to pumping and dipnetted after water level was reduced. WDFW observing.

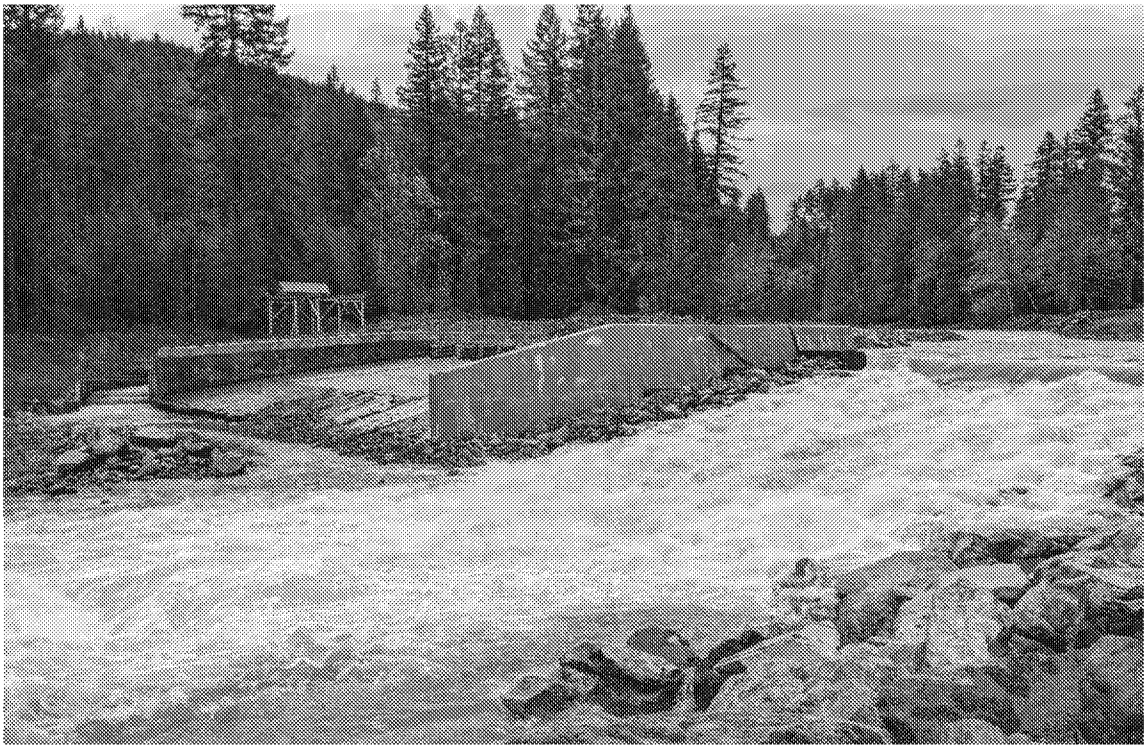
Attachment 4. Conservation Measures Implemented	
Date	Measure Taken
07/18-22/2020	Right bank slowly dewatered. No fish observed by crew.
07/24/2020	Crew and fish biologist performed fish recovery in fish ladder after flows redirected to allow liner installation at ladder. Ladder not dewatered.
07/30/2020 – 08/07/2020	Electron staff identified, recovered and removed 550 sq. yds. of ruptured HDPE liner and field turf from the river channel.
08/06/2020	Small oil scum/sheen seen on surface of settling pond. Origin likely organic in nature (crushed wood and plant oils). Oil boom deployed upon observation of scum.
08/09-10/2020	EH consultant performed site inspection. Additional HDPE liner, field turf, and crumb rubber identified for removal from river.
08/13/2020	Fish ladder observed for sign of adult salmonid migration. Observation included monitoring for jumping or leaping at attractant flows around base of fish ladder, and fish staging/holding around base of ladder.
08/26/2020	Fish ladder observed for sign of adult salmonid migration. Observation included monitoring for jumping or leaping at attractant flows around base of fish ladder, and fish staging/holding around base of ladder.
09/14/2020	Fish ladder observed for sign of adult salmonid migration. Observation included monitoring for jumping or leaping at attractant flows around base of fish ladder, and fish staging/holding around base of ladder.
09/22/2020	Fish ladder observation occurred after reports of staff seeing fish. Three fish sightings confirmed. Fish ID'd as Chinook. Management notified of fish presence.
09/23/2020	Dedicated daily observation of fish ladder began with construction commencement. No fish observed. Fish biologist identified location of imminent plastic erosion.
09/24/2020	Visual difference in turbidity at conveyance ditch vs. river. Construction halted from 10:00 to 10:45 to allow for turbidity to decrease. At 10:45, turbidity visually clearer than river, and construction continues. River inspection walk: previously identified plastic from 09/23/2020 was located and removed from the river.
09/25/2020	Excavator hydraulic hose leaks on land location below OHWM. Fish oil spill response is immediate, and spill contained within 20 minutes. No oil contact with river. River inspection walk identified small pieces of turf, and turf was secured and removed.
09/26/2020	First salmonid migrant sightings at fish ladder after first significant rain event of the season (09/23-09/25) brought large bump in river cfs, significant drop in background turbidity, and drop in ambient air and water temperatures. River inspection walk conducted. No rupture debris found.
09/27/2020	River had breached previously dry area upstream of the cofferdam overnight. Breach pool was assessed for possible fish recovery needs. Performed fish recovery. No fish sighted.
09/28/2020	Turbid water observed running through worksite and conveyance ditch. Crews asked to standby while pump 3 was turned on and turbid water routed

	through mitigation area. Discharge to river was tested and turbidity did not exceed background. Work continued after sampling results. River inspection walk conducted. Turf and plastic debris identified, compiled, and removed.
09/29/2020	A diesel cap was observed missing from a haul truck. Ounces of diesel were cleaned up immediately, and the cap was replaced. Breach pool re-assessed once turbidity settled. Confirmed no fish sighted.
09/30/2020	Attempts made at placing rock above upper entrance to fish ladder to decrease flow to ladder.
10/03/2020	Rocks placed at downstream entrance of fish ladder to attempt fix of passage issues. Concrete water runoff treated with CO_2 to decrease high pH. Water within pH parameters at point of discharge.
10/04/2020	Concrete water runoff treated with CO_2 to decrease high pH. Water within pH parameters at point of discharge.
10/05/2020	Fish ladder downstream entrance revisited. Passage remedied by creation of two rock step pools in ladder tailrace via excavator.
10/06/2020	Per WQMP change, water infiltrating worksite downstream of spillway was tested and found to be significantly lower in NTU than river background. This water was pumped back to the river before reaching worksite.
10/08/2020	Turbid water at worksite was pumped to the conveyance channel as per BMP. No turbid discharge reached the river; mitigation successful.
10/09/2020	Sampling of concrete runoff downstream of worksite indicated pH above background. Concrete water runoff treated with CO_2 to decrease high pH. Water within pH parameters at point of discharge.
10/15/2020	Concrete water runoff treated with CO_2 to decrease high pH. Water within pH parameters at point of discharge. Road access maintenance caused increase in turbidity; operator halted work until turbidity decreased successfully.
10/19/2020	Fish ladder monitoring: last adult salmon sighting of in-water work period.
10/25/2020	Crews and fish biologist cleared dewatered right bank and fish ladder in extensive fish recovery effort.
10/26/2020	River inspection walk conducted.
10/26-28/2020	All foreign material (turf, felt liner, HDPE liner, conexes, sandbags, equipment) removed from the bypass channel. Channel graded and restored. Natural woody debris and downed logs replaced below spillway.
10/28/2020	All in-water work completed.
10/30/2020	River inspection walk conducted. Most turf and liner ID'd by PTOI found, collected, and removed from Puyallup River and LeDout Creek.
11/02/2020	River inspection walk conducted. Debris identified, collected, and removed.
11/03/2020	All remaining debris at LeDout Creek ID'd by PTOI was found and removed.
09/23/2020 – 11/15/2020	Fish ladder function monitored daily by on-site biologist.

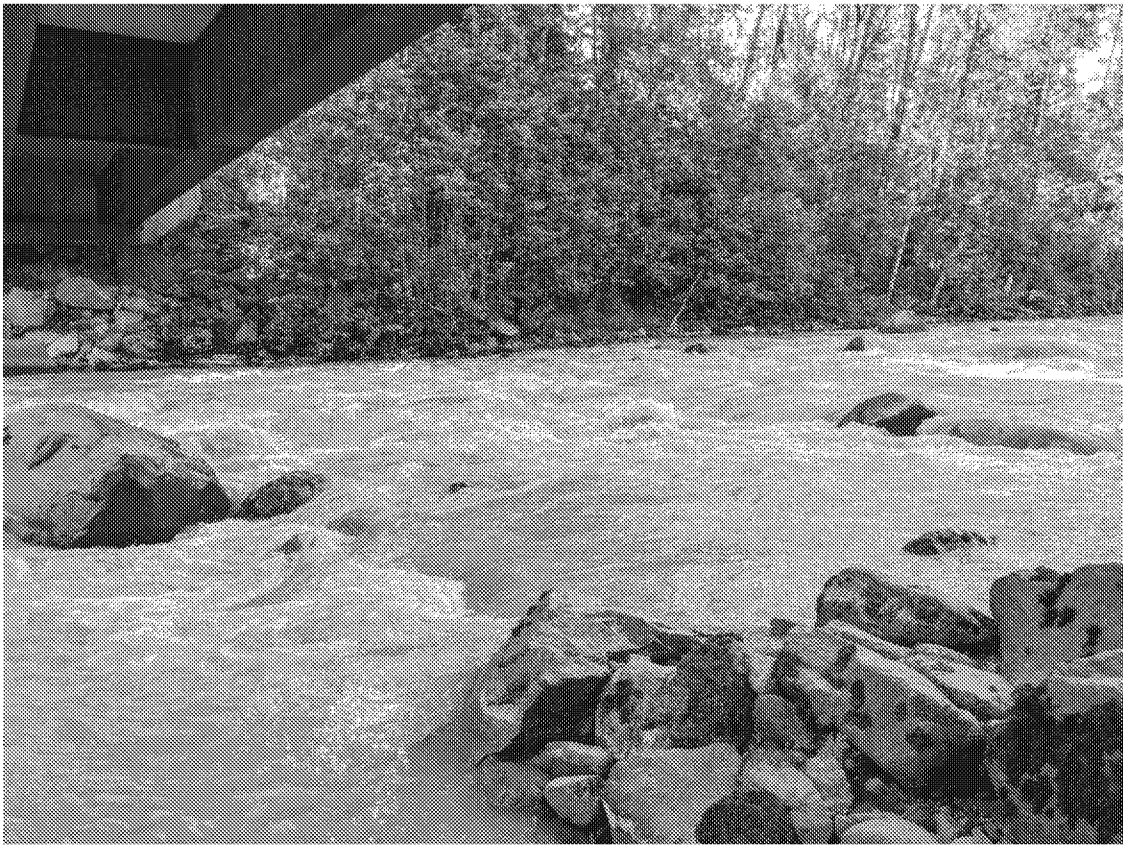
Attachment 5. Supporting Photographs

Spillway, Pre-Construction

Spillway, Post-construction



Upstream Turbidity Sampling Location



Downstream Turbidity Sampling Location